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February 27, 2002

Mr Melvin and Lerah Parker
P O Box 609
Libby, Montana 59923

Subject **Hydrologic Review of Rainy Creek Restoration Project**
Parker Property near Libby, MT

Dear Mr and Mrs Parker

Pursuant to your request, on February 27, 2002, Water Consulting, Inc conducted a site review of the Rainy Creek restoration project implemented in conjunction with the Environmental Protection Agency and US Department of Transportation (USDOT) The primary objective of the field review was to ascertain the as-built" geomorphic conditions of the project, including rip-rap stability, channel bed stability, fish passage potential, and conveyance capacity of the constructed channel Additionally, Water Consulting, Inc (WCI) reviewed the hydrologic and engineering calculations prepared by the USDOT in support of the as-built design Based upon our field review and analysis of hydrologic and geomorphic data collected by WCI, it is our professional opinion that the following issues need to be addressed at the site and considered with all future work of this nature on Rainy Creek

- Accuracy of hydrologic and flood flow analysis
- Channel geometry and grade control
- Rip-rap sizing and installation
- Culvert capacity and fish passage
- Water rights

The following sections discuss these issues as related to the Rainy Creek restoration project implemented on the Parker property

1 0 Hydrology and Flood Flow Analysis

On January 14, 2002, Mr John McGuiggin, PE and Project Manager for USDOT summarized the methods used to size the riprap As noted in his letter to Mr Parker, the design size of the riprap was calculated using the creek geometry and a flow rate of 90 cubic feet per second, which conservatively assumes the culvert flowing full As part of our review of this project, WCI conducted a hydrology and flood flow analysis to determine the flood series including the Q_2 Q_{10}, Q_{25}, Q_{50} and Q_{100} events Omang

(1992) developed regression equations for Montana using the peak flow-gaging network The equations are based on area weighted mean annual precipitation and basin size Rainy Creek lies within the west region The equations applied to Rainy Creek are as follows

Table 1 Results of USGS Regional Equations, Rainy Creek

$$Q_2 = 0\ 042\ A^{0\ 94} P^{1\ 49} = 97 \text{ cfs}$$
$$Q_{10} = 0\ 234\ A^{0\ 90} P^{1\ 25} = 214 \text{ cfs}$$
$$Q_{25} = 0\ 379\ A^{0\ 87} P^{1\ 19} = 258 \text{ cfs}$$
$$Q_{50} = 0\ 496\ A^{0\ 86} P^{1\ 17} = 306 \text{ cfs}$$
$$Q_{100} = 0\ 615\ A^{0\ 85} P^{1\ 15} = 344 \text{ cfs}$$

Based on the results of the USGS regional equations, it appears as though the riprap gradation and channel geometry was determined for less than the two-year recurrence interval discharge (see Table 1) As described in the following sections, consideration of flows greater than 90 cfs is integral to proper design of this project for several reasons namely rip-rap sizing, vertical bed stability and floodwater conveyance

2 0 Channel Geometry and Longitudinal Profile

2 1 Channel Geometry

WCI collected cross-sectional data from a representative riffle cross-section on the Parker property to evaluate as-built channel design dimensions Additionally data was collected from a reference reach located upstream of Highway 56 The reference reach displayed similar valley, slope and channel characteristics as the Parker section of Rainy Creek prior to restoration, and as such, can serve as a comparative tool for evaluating as built channel dimensions on the Parker property (see Table 2) As built and reference channel cross-sections are included as an appendix to this report

Table 2
As-Built Channel Dimensions vs Reference Reach Conditions
Rainy Creek near Libby, MT

Cross-Section ID	Bankfull Channel Dimension			
	Width (ft)	Mean Depth (ft)	Flow Area (ft^2)	Entrenchment Ratio
As-Built on Parker Property	9 82	1 34	13 2	1 83
Reference Reach Upstream Hwy 56	13 4	1 70	23 3	3 8

Channel design is based on sizing the active channel to the bankfull flow conditions (approximate 2 0 year recurrence interval discharge) and providing an adequate floodplain to accommodate flood events, including the 100-year discharge (Rosgen and Silvey, 1996 and Leopold et al 1964) Most channel dimensions including width and depth, are related to the bankfull discharge It is evident from field measurement that the as-built cross section design on the Parker property deviates from the reference dimensions In particular, the constructed bankfull cross-sectional area is approximately 43% less than the reference reach This likely resulted from encroachment on the channel from riprap revetment Additionally, the width and cross-sectional area of the floodplain is appreciably lower than necessary for this type of stream and flood series

2 2 Longitudinal Profile

In the project area, average as-built channel slope is approximately 7 3% (073 ft/ft) Generally, when the average slope of the channel exceeds four percent, bedform profile transitions from a riffle-pool dominated channel to a step-pool channel In step-pool systems such as the Rainy Creek restoration project area step frequency is directly proportional to channel width and indirectly proportional to slope As slope increases, the spacing between steps and pools decreases Steps and pools are the primary grade control and energy dissipation mechanism in these types of streams and are vital to the vertical stability of the channel

WCI collected longitudinal profile information from both the project area and the reference reach located upstream of Highway 56 (see appendix items) As previously noted, the reference reach displayed similar valley slope, and channel characteristics as the Parker property prior to restoration As such, the reach can serve as a comparative tool for evaluating as-built channel dimensions of the restoration project In the reference reach, steps and pools, with an average spacing of 12-ft, dominated the bedform profile The ratio of steps to bankfull channel width ranged from 1 0–1 3, which is typical for these types of streams Within the Parker restoration reach, and as displayed in the attached longitudinal profile, the channel was dominated by a homogenous extended high gradient riffle The reach lacked steps and pools which function naturally to dissipate energy in the system and reduce boundary shear stress during high flows

It is evident from the analysis of as-built channel cross-section dimensions and bed profile that the channel, as constructed, is undersized in terms of capacity and lacks the proper bedform features common for these types of streams and geomorphic setting It is our professional opinion that if maintained in its current configuration, the potential for channel degradation (down cutting) is likely If this were to occur the bank placed riprap revetment would be highly susceptible to scour and entrainment WCI recommends expanding the cross-sectional flow area and installing grade control weirs to maintain bed stability and the sediment transport competency of the project area (see Section 6 0 Conclusion and Recommendations)

3 0 Rip-Rap Sizing and Installation

As stated in Mr John McGuiggin s letter to Mr Parker dated January 14 2002, the size of the rip-rap was calculated using the creek geometry and a flow rate of 90 cubic feet per second, which conservatively assumes the culvert flowing full

WCI completed a systematic sampling of the bank placed riprap revetment to determine the particle size distribution of the north bank and south bank (as built) Table 3 summarizes the results of the sampling Sediment distribution curves are attached as an appendix to this report

Table 3
As-Built Rip-Rap Gradation
North and South Banks, Rainy Creek

Particle Size	North Bank (mm)	South Bank (mm)
D_{15}	199	129
D_{35}	281	156
D_{50}	331 (1 1 ft)	180 (59-ft)
D_{84}	468	296
D_{95}	609	354

Referring to the MDOT Standard Specifications for Road and Bridge Construction, 1995 edition, the D_{50} of MDOT Class II riprap is 1 32 ft or 16-inches As evident from Table 3, the median size of riprap placed on both bank is less than the recommended size of 1 32-ft Based on HEC-11 Guidelines for Riprap Sizing, the south bank gradation will be susceptible to scour at flows greater than the 10-year recurrence interval discharge (214 cfs)

In terms of keying of the riprap, it is likely that the toe rock was not installed deep enough into the channel bed to resist scour If grade controls had been incorporated in the project, it is possible that the existing riprap depth would have been adequate However, given the fact that the channel is undersized and lacks grade control (see discussion under Section 2 0) it is likely that the potential for failure at the toe slope is likely during high flow events Excavation of several observation pits is recommended to determine the as-built depth of the riprap toe

4 0 Culvert Capacity and Fish Passage

The project included installation of a 48-inch corrugated metal pipe Based on the flood series summarized in Section 1 0, the culvert is undersized and likely serves as a fish passage barrier during moderate and higher discharges Table 4 summarizes the results of culvert hydraulics for discharges ranging from 50 0 cfs to 120 0 cfs (full capacity with 3-ft headwall at inlet)

Table 4 Summary of Culvert Hydraulics		
Flow Rate (cfs)	Headwater Elevation*	Outlet Velocity (f/s)
50	6 49	13 72
60	6 94	14 43
70	7 39	15 05
80	7 83	15 60
90	8 35	16 09
100	8 83	16 53
110	9 54	16 93
120	10 29	17 29

*assumes inlet invert elevation of 3 285-ft

The maximum capacity of the culvert, with a calculated headwall of 3 0-ft at the inlet, is 120 cfs Three feet was determined to be the maximum acceptable head at the inlet without jeopardizing the stability of the road fill or overtopping of the road prism A flow rate of 120 cfs is less than the estimated 10-year recurrence interval discharge As such, at discharges greater than 120-cfs, flow will cause significant backwater deposition of sediment and likely threaten the structural integrity of the road fill Backwater deposition would likely initiate a series of in channel adjustments including lateral channel erosion and riprap failure

Additionally, the outlet velocities likely serve as a velocity barrier to trout migrating from the Kootenai River to the upper reaches of Rainy Creek While a detailed fish passage analysis was not completed at this time, a more thorough analysis using FishXING is recommended Table 5 summarizes swimming capabilities of various fish species including brown trout, rainbow trout, and rainbow cutthroat trout x westslope cutthroat hybrids As evident outlet velocities exceed the swimming speeds of all species included in Table 5

Table 5 Relative Swimming Speeds (ft/s) of Average Size Adult Fish				
Specie	Maximum Speed	Cruising Speed	Sustained Speed	Burst Speed
Trout	11 48[1]	0-2 0[2]	2 0-6 6[2]	6 6-13 5[2]
Brown Trout	12 8[3]	0-2 3	2 3-6 1	6 1-12 8
RCT x WCT[4]	12 5			12 5
RCT[4]	12 5	-	-	12 5

[1] Denil (1938)
[2] Bell (1973)
[3] Kreitmann (1933)
[4] Region 1 MFWP Personal Correspondence with WCI (2001)

It is also evident that the outlet of the Highway 56 CMP is functioning as a fish passage barrier While a more thorough fish passage analysis is recommended the existing channel configuration could be modified into a series of step-pool structures to provide fish passage and energy dissipation

5 0 Water Rights

Currently, the point of diversion (POD) previously located at the outlet of the Highway 56 CMP is unusable Prior to restoration activities, a small pool existed at the outlet that provided a stilling basin for an intake structure attached to a 2HP pump (personal correspondence with Melvin Parker) Currently, due to the excessive drop at the outlet and lack of pool, intake from this section of the stream is not feasible It will be necessary to modify the existing channel configuration at the outlet or relocate the POD to a suitable location downstream

6 0 Conclusion and Recommendations

Based on WCI s review of the Rainy Creek Restoration Project, it is our professional opinion that several modifications to the existing project are needed to ensure the project maintains channel stability, water quality, and its designated beneficial uses In summary, WCI recommends the following actions be considered by the USDOT and EPA

- Perform a more detailed hydrologic analysis of the project area to determine appropriate design dimensions and the locations of proposed modifications,
- Install grade control structures (step weirs) to provide for energy dissipation and sediment transport,
- Modify sections (where needed) of the as-built channel to increase bankfull cross-sectional area,
- Expand the floodprone width (where needed) to increase floodwater conveyance This may be achieved by modifying the cross section dimensions in places to allow for construction of a narrow bankfull floodplain within the existing rip-rap/geotextile banks,
- Excavate several excavation pits to determine the depth of the rip rap toe,
- Remove smaller size class rip-rap and add larger angular rock sized to MDOT Class II standards on both the north and south banks,
- Install velocity baffles in the existing culvert to provide for fish passage and consider installation of floodplain relief culverts to increase the crossing capacity,
- Following these modifications, implement a rigorous revegetation effort to include native shrub and overstory species

Prior to initiating any further work on Rainy Creek, including the revegetation component of the project, WCI recommends that USDOT and the EPA consider these modifications to the existing project area The purpose of this letter report is to highlight the issues and concerns that will affect the stability and function of Rainy Creek from Highway 56 downstream to the confluence with the Kootenai River We understand that some of the concepts discussed in this letter may require additional explanation and/or discussion As such, WCI would welcome the opportunity to meet with representatives of USDOT and the EPA to discuss these issues in greater detail

WCI appreciates the opportunity to assist you with this important project If we may be of further assistance to you or the EPA and USDOT, please feel free to contact us at your convenience

Sincerely,

Water Consulting, Inc

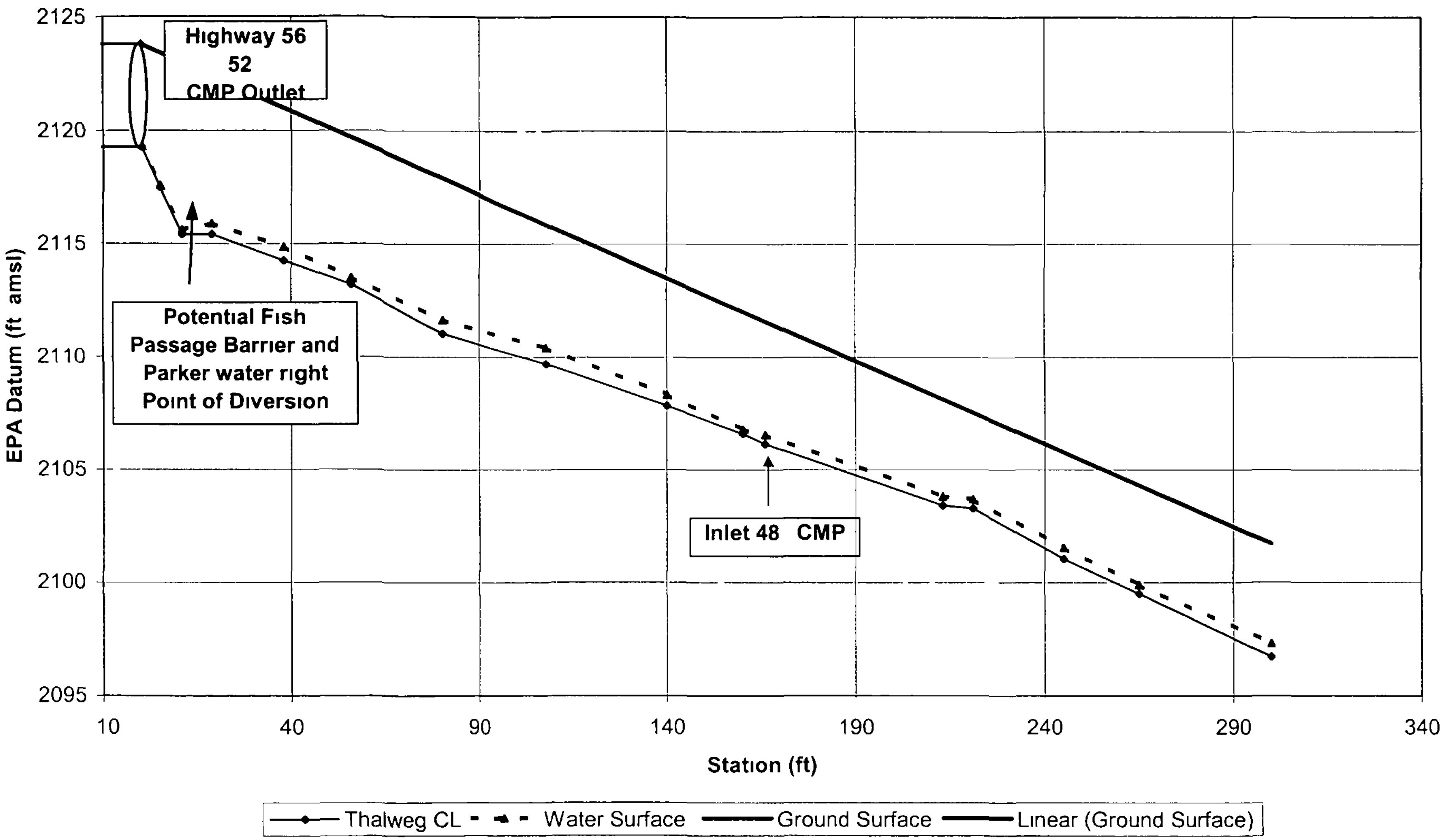
John M Muhlfeld
Hydrologist

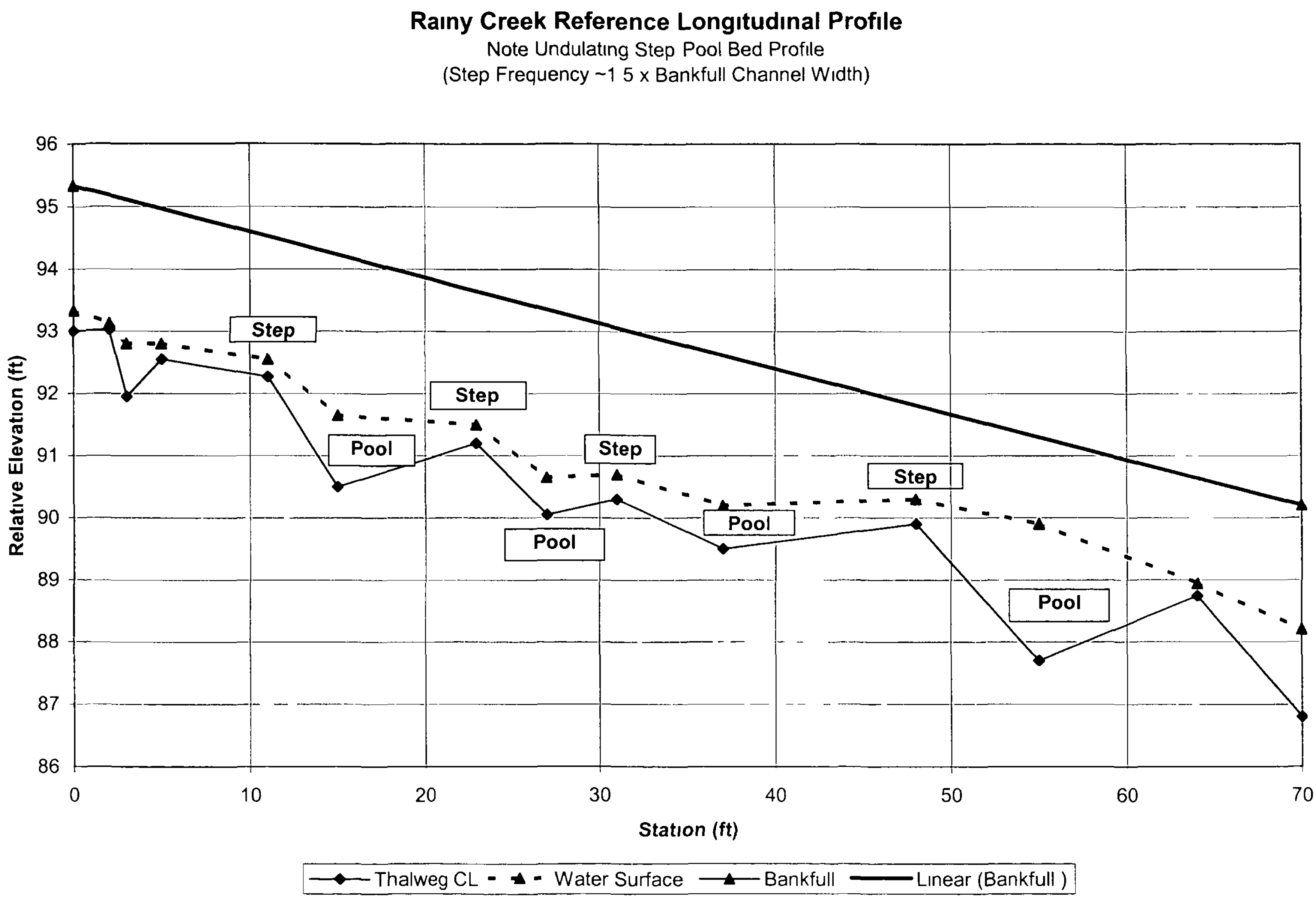
Matt Daniels PE
Civil Engineer

Cc Kirk Sullivan, NRCS
Paul Peronard, EPA
Mike Hensler, MTFWP

ATTACHMENTS AND APPENDIX ITEMS

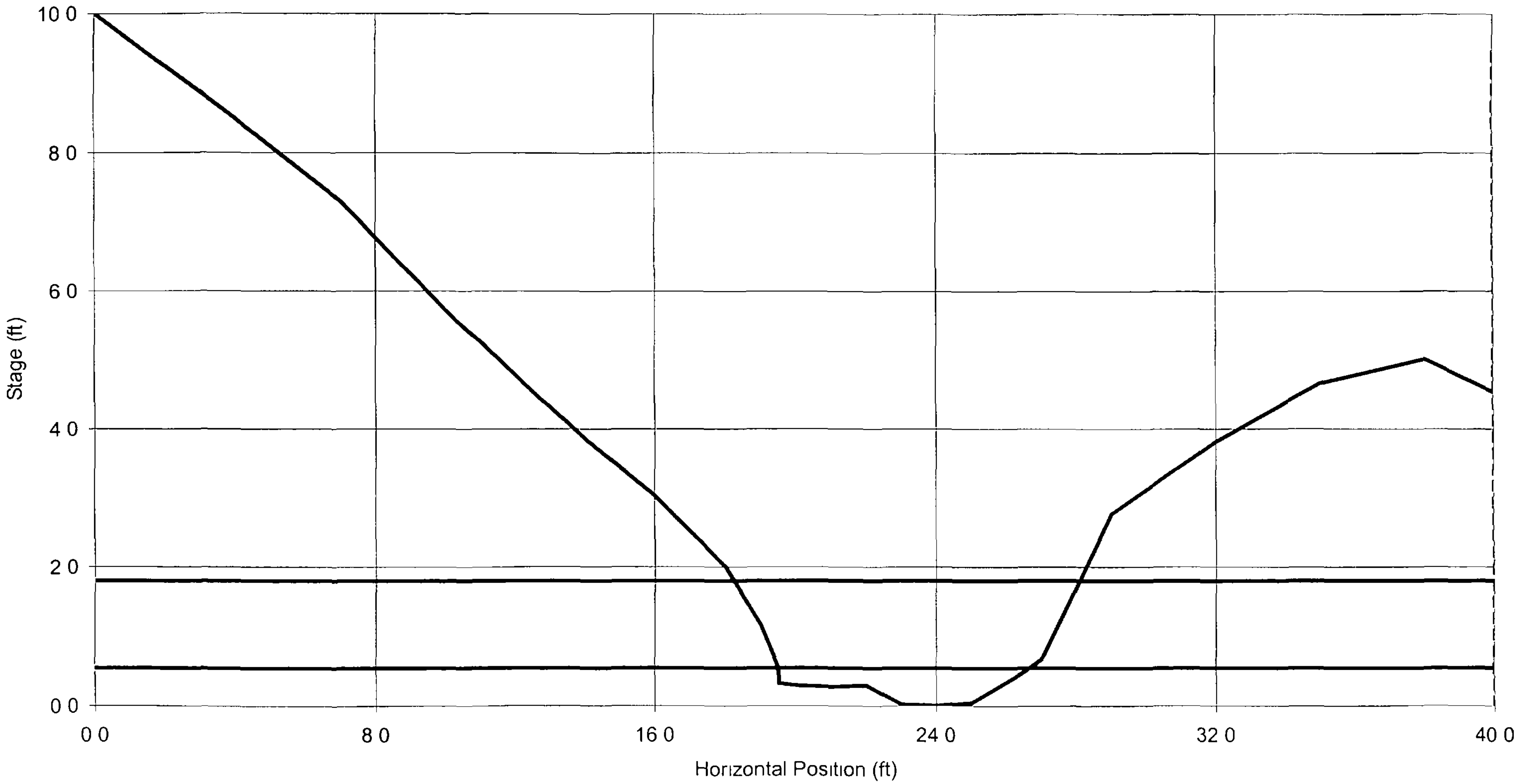
Rainy Creek Typical As-Built Longitudinal Profile
Melvin and Lerah Parker Property
(note lack of steps and pools and riffle extension)





Rainy Creek Reference Longitudinal Profile
Note Undulating Step Pool Bed Profile
(Step Frequency ~1 5 x Bankfull Channel Width)
Relative Elevation (ft)
96
95
94
93
92
91
90
89
88
87
86
Step
Pool
Step
Pool
Step
Pool
Step
Pool
0
10
20
30
40
50
60
70
Station (ft)
Thalweg CL
Water Surface
Bankfull
Linear (Bankfull)

Hydraulic Analysis of Rainy Creek Restoration Project Discharge = 97 CFS (Q2 0)



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impact out

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Analysis Procedure	Hydraulics
Cross Section Number	1
Survey Date	02/27/02

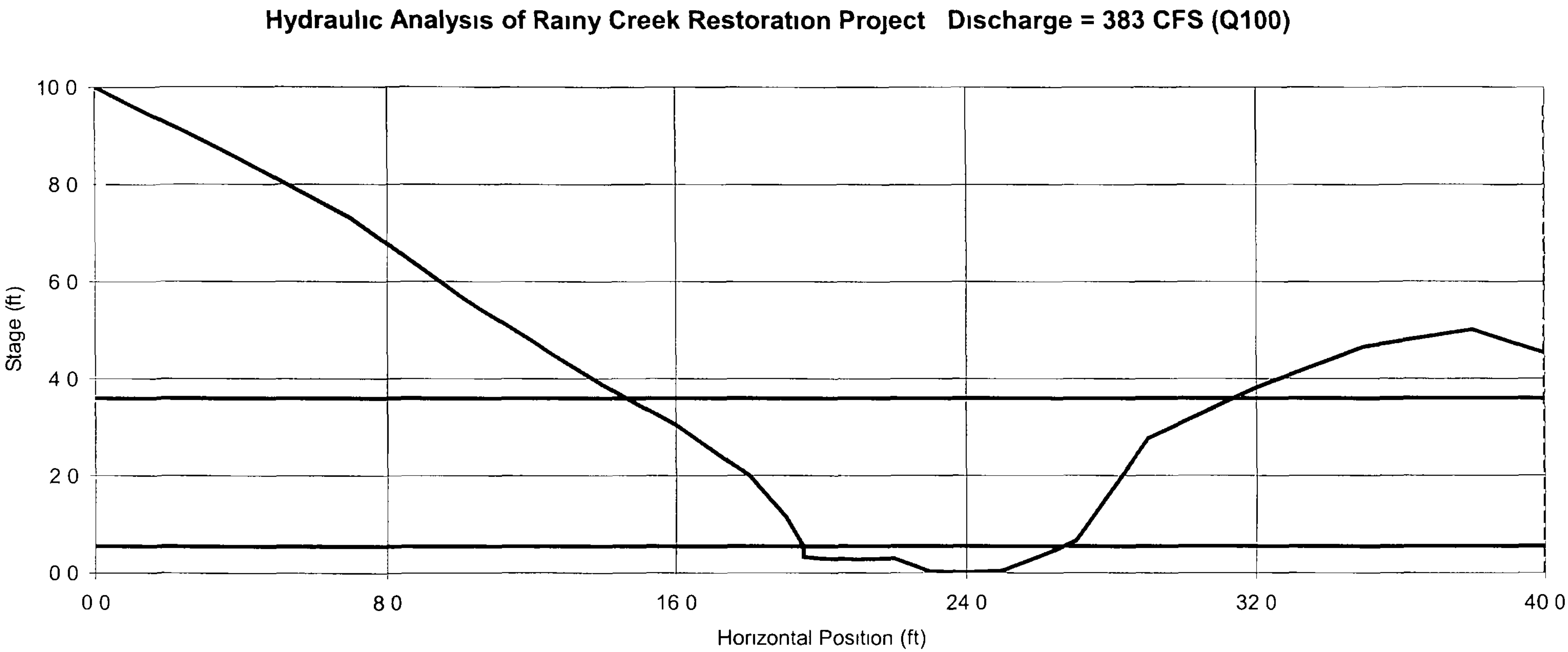
Rainy Creek Hydraulic Analysis (Parker Reach)

Subsections/Dividing stations
A

Resistance Method	Manning s n
SECTION	A
Low Stage n	0 178
High Stage n	0 060

STAGE (ft)	#SEC	AREA (sq ft)	PERIM (ft)	WIDTH (ft)	R (ft)	DHYD (ft)	SLOPE (ft/ft)	n	VAVG (ft/s)	Q (cfs)	SHEAR (psf)
0 54	T	2 50	7 50	7 16	0 33	0 35	0 073	0 178	1 09	2 71	1 52
0 79	T	4 38	8 35	7 82	0 53	0 56	0 073	0 155	1 69	7 43	2 39
1 04	T	6 39	9 02	8 26	0 71	0 77	0 073	0 131	2 44	15 61	23
1 29	T	8 52	9 72	8 75	0 88	0 97	0 07	0 108	3 42	29 15	3 99
1 54	T	10 77	10 45	9 28	1 03	1 16	0 073	0 084	4 87	52 46	4 70
1 79	T	13 16	11 18	9 82	1 18	1 34	0 073	0 061	7 36	96 91	5 36

STAGE	ALPHA	FROUDE
0 54	1 00	0 32
0 79	1 00	0 40
1 04	1 00	0 49
1 29	1 00	0 61
1 54	1 00	0 80
1 79	1 00	1 12


Hydraulic Analysis of Rainy Creek Restoration Project Discharge = 383 CFS (Q100)
10 0
8 0
6 0
4 0
2 0
0 0
Stage (ft)
0 0
8 0
16 0
24 0
32 0
40 0
Horizontal Position (ft)

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Run Date 02/27/02
Analysis Procedure Hydraulics
Cross Section Number 1
Survey Date 02/27/02
Rainy Creek Hydraulic Analysis (Parker Reach)

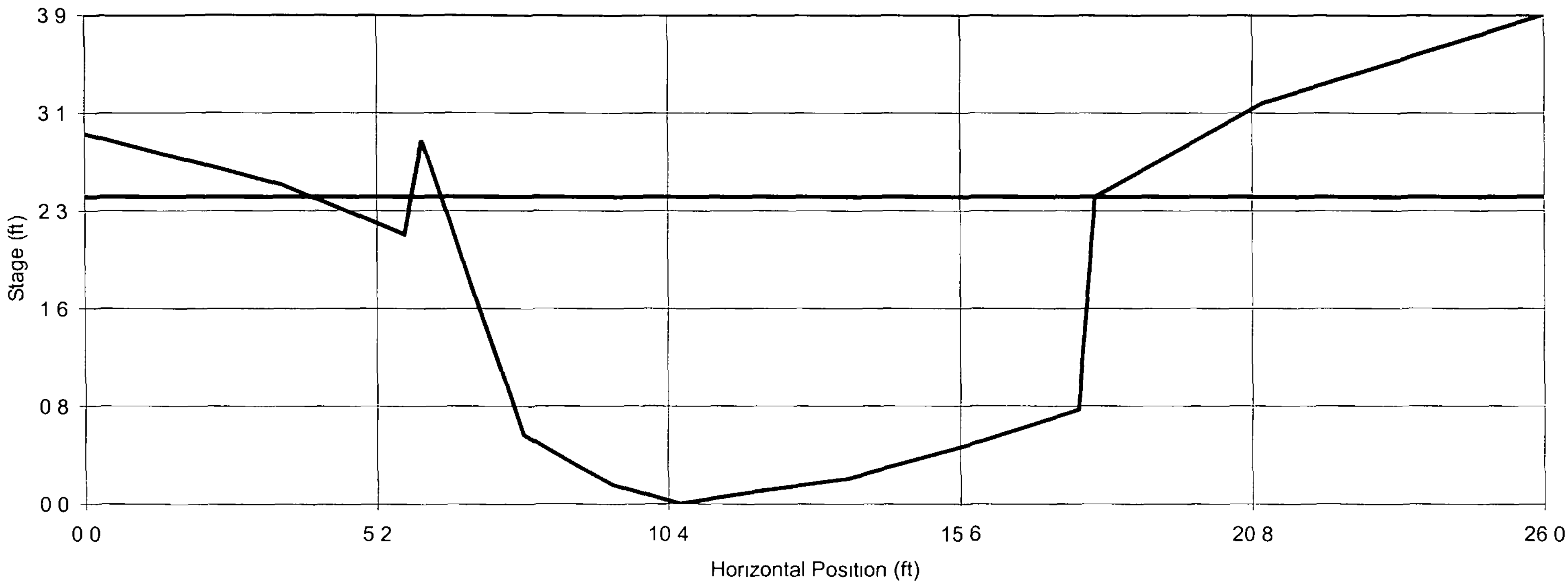
Subsections/Dividing stations
A

Resistance Method	Manning s n
SECTION	A
Low Stage n	0 319
High Stage n	0 058

STAGE (ft)	#SEC	AREA (sq ft)	PERIM (ft)	WIDTH (ft)	R (ft)	DHYD (ft)	SLOPE (ft/ft)	n	VAVG (ft/s)	Q (cfs)	SHEAR (psf)
0 54	T	2 50	7 50	7 16	0 33	0 35	0 073	0 319	0 61	1 51	1 52
0 79	T	4 38	8 35	7 82	0 53	0 56	0 073	0 298	0 88	3 86	2 39
1 04	T	6 39	9 02	8 26	0 71	0 77	0 073	0 276	1 16	7 41	3 23
1 29	T	8 52	9 72	8 75	0 88	0 97	0 073	0 255	1 45	12 32	3 99
1 54	T	10 77	10 45	9 28	1 03	1 16	0 073	0 234	1 76	18 94	4 70
1 79	T	13 16	11 18	9 82	1 18	1 34	0 073	0 212	2 11	27 80	5 36
2 04	T	15 68	11 94	10 38	1 31	1 51	0 073	0 191	2 53	39 63	98
2 29	T	18 37	12 83	11 10	1 43	1 65	0 073	0 170	3 01	55 4	6 2
2 54	T	21 23	13 71	11 82	1 55	1 80	0 073	0 148	3 63	77 08	7 05
2 79	T	24 28	14 63	12 57	1 66	1 93	0 073	0 127	4 44	107 77	56
3 04	T	27 57	15 93	13 77	1 73	2 00	0 073	0 106	5 49	151 25	7 88
3 29	T	31 17	17 34	15 08	1 80	2 07	0 073	0 084	7 05	219 76	8 19
3 54	T	35 11	18 75	16 40	1 87	2 14	0 073	0 063	9 69	340 24	8 53
3 60	T	36 10	19 09	16 72	1 89	2 16	0 073	0 058	10 62	383 2[illegible]	8 62

STAGE	ALPHA	FROUDE
0 54	1 00	0 18
0 79	1 00	0 21
1 04	1 00	0 23
1 29	1 00	0 26
1 54	1 00	0 29
1 79	1 00	0 32
2 04	1 00	0 36
2 29	1 00	0 41
2 54	1 00	0 48
2 79	1 00	0 56
3 04	1 00	0 68
3 29	1 00	0 86
3 54	1 00	1 17
3 60	1 00	1 27

Channel Geometry of Rainy Creek Reference Reach, Upstream of Hwy 56



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Survey Date 02/28/02
REFERENCE REACH UPSTREAM OF HWY 56

Subsections/Dividing stations
A / 25 98/ @

DISTANCE BELOW DATUM (ft)	#SEC	AREA (sq ft)	PERIM (ft)	WIDTH t	R (ft	DHYD (ft)
0 00	T	0 00	0 00			
0 20	T	2 60	1 80			
0 45	T	5 40	3 00			
0 70	T	8 0	3 60			
0 95	T	10 90	4 10			
1 20	T	13 60	4 70			
1 45	T	16 20	5 30			
1 70	T	18 70	5 90			
1 95	T	21 00	8 00			
2 20	T	22 60	11 10			
2 45	T	23 30	16 10	13 40	1 40	1 70

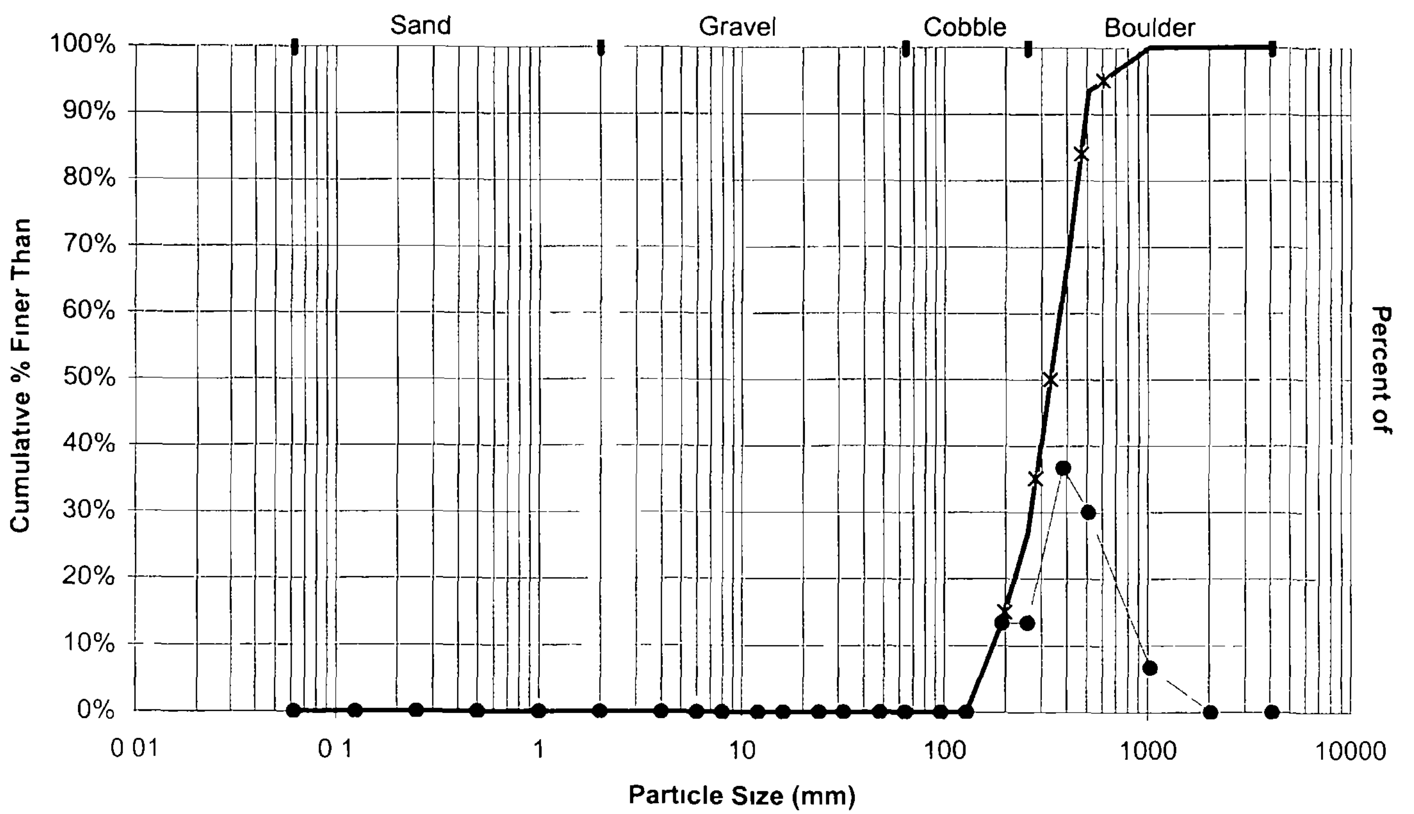
Pebble Count Worksheet

Particle Size (mm)		% finer than	Total Count
<0 062		0%	0
0 062	0 125	0%	0
0 125	0 25	0%	0
0 25	0 5	0%	0
0 5	1 0	0%	0
1	2	0%	0
2	4	0%	0
4	6	0%	0
6	8	0%	0
8	12	0%	0
12	16	0%	0
16	24	0%	0
24	32	0%	0
32	48	0%	0
48	64	0%	0
64	96	0%	0
96	128	0%	0
128	192	13%	4
192	256	27%	4
256	384	63%	11
384	512	93%	9
512	1024	100%	2
1024	2048	100%	0
2048	4096	100%	0

COMMENTS **Distribution curve noting size of rip rap placed on north bank**

STREAM NAME **Rainy Creek**
ID NUMBER **North Bank Rip Rap Distribution Curve**
DATE **2/27/2002**
CREW **JMM, Water Consulting, Inc**

Particle Size Distribution (mm)	**D15**	**D35**	**D50**	**D84**	**D95**
	199 0	**280 7**	**331 4**	**468 2**	**608 9**



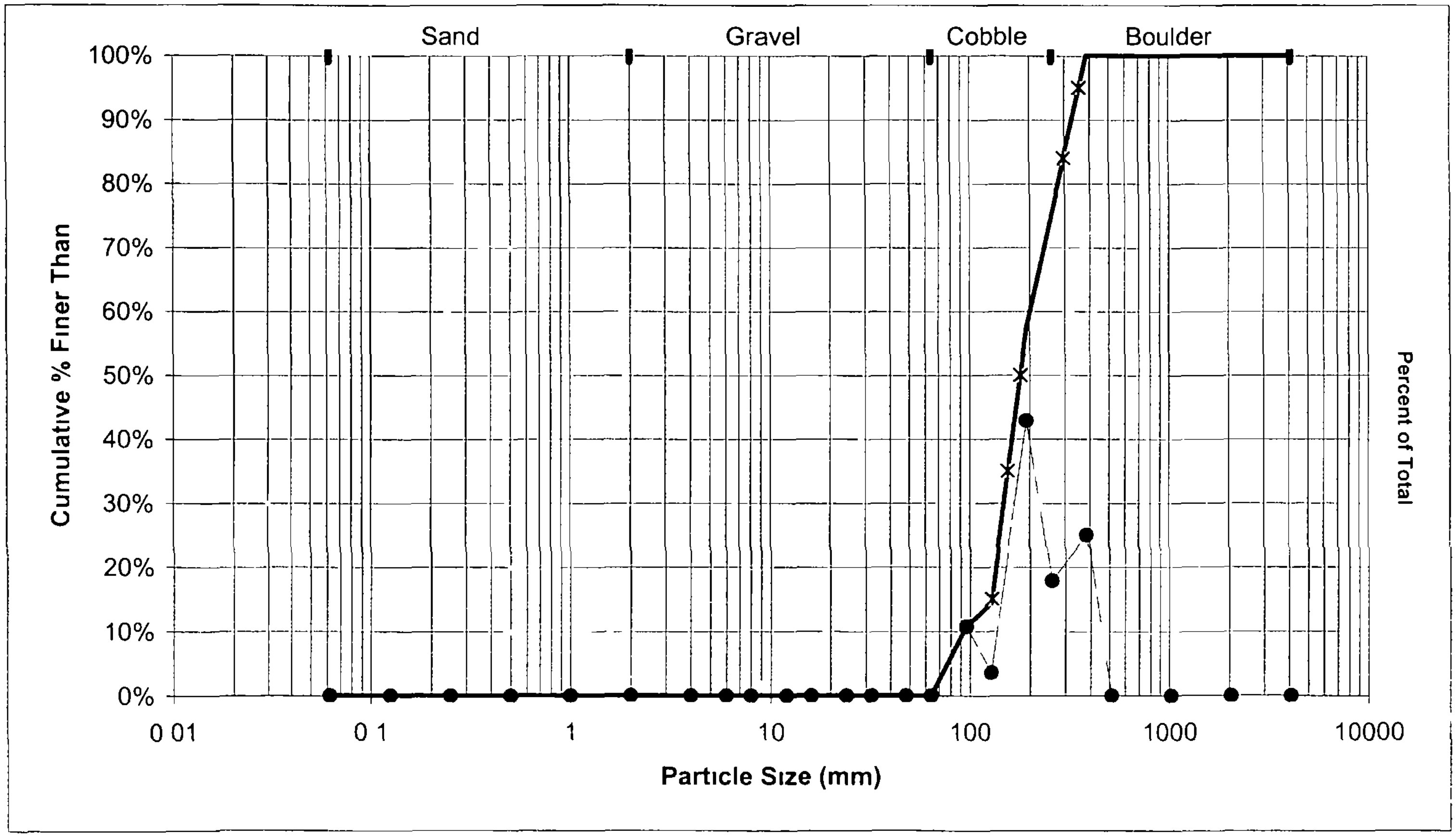
Pebble Count Worksheet

COMMENTS **Distribution curve noting size of rip rap placed on south bank**

Particle Size (mm)	% finer than	Total Count
<0 062	0%	0
0 062 0 125	0%	0
0 125 0 25	0%	0
0 25 0 5	0%	0
0 5 - 1 0	0%	0
1 - 2	0%	0
2 - 4	0%	0
4 - 6	0%	0
6 - 8	0%	0
8 12	0%	0
12 16	0%	0
16 24	0%	0
24 32	0%	0
32 48	0%	0
48 64	0%	0
64 96	11%	3
96 128	14%	1
128 192	57%	12
192 256	75%	5
256 384	100%	7
384 512	100%	0
512 1024	100%	0
1024 2048	100%	0
2048 4096	100%	0

STREAM NAME **Parker Property**
ID NUMBER **South Bank Rip Rap Distribution**
DATE **2/27/2002**
CREW **JMM, Water Consulting, Inc**

Particle Size	D15	D35	D50	D84	D95
Distribution (mm)	128 9	155 7	179 5	296 2	354 1



RAINY CREEK | 2|28|02 | MSD

REFERENCE HEC-11 GUIDELINES FOR RIPRAP SIZING

$$D_{50} = \frac{K_u C V_{avg}^3}{d_{avg}^{0\,5} K_1^{1\,5}}$$

Assume SAFETY FACTOR = 1 2
S_s = 2 65

$$C = \frac{1\,61\,(SF)^{1\,5}}{(S_s - 1)^{1\,5}} = \frac{(1\,61)(1\,2)^{1\,5}}{(2\,65 - 1)^{1\,5}} = 1\,00$$

K_u = 0 001

Assume 1½ 1 side slopes
42° Angle of repose

$$K_1 = \left[1 - \frac{\sin^2\theta}{\sin^2\phi}\right]^{0\,5} = \left[1 - \frac{\sin^2 33\,7^\circ}{\sin^2 42^\circ}\right]^{0\,5} = 0.56$$

@ Q_{100} = 340 cfs

V_{AVG} = 9.7 fps d_{AVG} = 2.14 ft

$$D_{50} = \frac{(0\,001)(1\,00)(9.7)^3}{(2.14)^{0\,5}\;(0\,56)^{1\,5}} = \frac{0\,913}{0\,613} = 1\,49\text{ ft} = 18''$$

FROM FIELD INVESTIGATION

D_{50} SOUTH BANK = 7"

D_{50} NORTH BANK = 13"

MDT CLASS II RIPRAP D_{50} = 1 32' = 16"

RAINY CREEK | 2/28/02 | MED

@ Q_{10} = 214 cfs

V_{AVG} = 7 05 fps

D_{AVG} = 2 07 ft

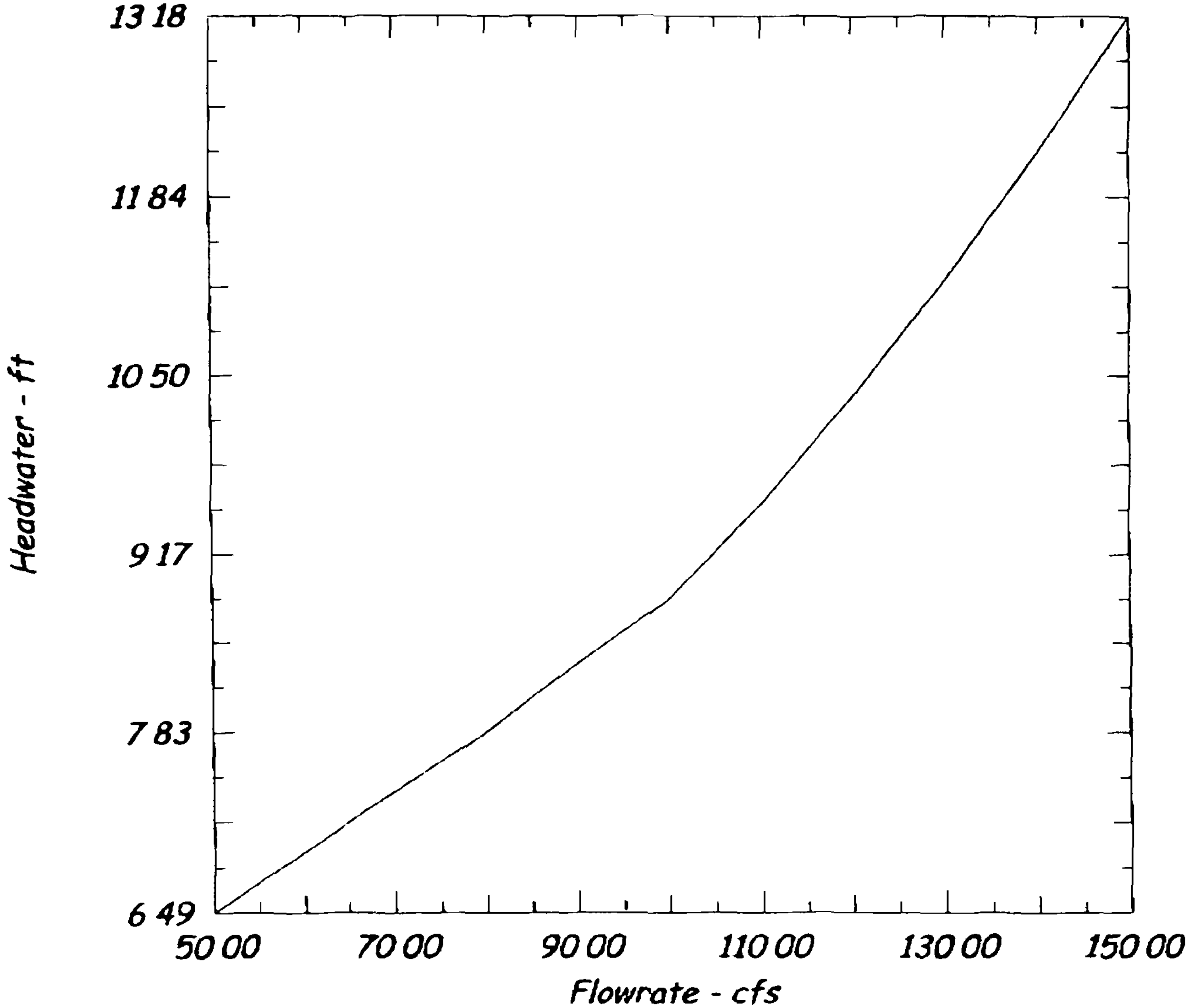
$$D_{50} = \frac{(001)(1\,00)(7\,05)^3}{(2\,07)^{0\,5}\,(0\,56)^{1\,5}} = \frac{0\,350}{0\,603} = 0\,58' = 7''$$

22 141 50 SHEETS
22 142 100 SHEETS
22 144 200 SHEETS

AMPAD

WATER CONSULTING, INC

Performance Curve



Note Upstream invert = 3 29 ft
top of pipe = 7 29 ft

Rainy Creek

Culvert Calculator

Entered Data

Shape	Circular
Number of Barrels	1
Solving for	Headwater
Chart Number	2
Scale Number	3
Chart Description	CORRUGATED METAL PIPE CULVERT
Scale Decsription	PIPE PROJECTING FROM FILL
Overtopping	off
Flowrate	60 0000 cfs
Manning's n	0 0240
Roadway Elevation	10 2850 ft
Inlet Elevation	3 2850 ft
Outlet Elevation	0 0000 ft
Diameter	48 0000 in
Length	45 0000 ft
Entrance Loss	0 0000
Tailwater	4 0000 ft

Computed Results

Headwater	6 9400 ft Inlet Control
Slope	0 0730 ft/ft
Velocity	14 4319 fps

Messages

Computing Inlet Control headwater
Solving Inlet Equation 26
Solving Inlet Equation 28
Headwater 10 3418 ft

DIS-CHARGE Flow cfs	HEAD-WATER ELEV ft	INLET CONTROL DEPTH ft	OUTLET CONTROL DEPTH ft	FLOW TYPE	NORMAL DEPTH in	CRITICAL DEPTH in	OUTLET VEL fps	OUTLET DEPTH ft	TAILWATER VEL fps	TAILWATER DEPTH ft
50 00	6 49	3 21	0 00	NA	15 93	25 46	13 72	1 33	0 00	4 00
60 00	6 94	3 65	0 00	NA	17 54	28 01	14 43	1 46	0 00	4 00
70 00	7 39	4 10	0 00	NA	19 07	30 35	15 05	1 59	0 00	4 00
80 00	7 83	4 55	0 00	NA	20 52	32 52	15 60	1 71	0 00	4 00
90 00	8 35	5 06	0 00	NA	21 93	34 52	16 09	1 83	0 00	4 00
100 00	8 83	5 54	0 00	NA	23 30	36 36	16 53	1 94	0 00	4 00
110 00	9 54	6 25	0 00	NA	24 65	38 05	16 93	2 05	0 00	4 00
120 00	10 29	7 00	0 00	NA	25 97	39 58	17 29	2 16	0 00	4 00